

Remarks

Claims 1 – 11 are pending in the present application. Claims 1 – 11 were rejected in the Office Action mailed July 27, 2003.

Claims 1 – 2, 4 and 11 were rejected as anticipated under 35 U.S.C. 102(b) by U.S. Patent No. 5,827,608 issued to Rinehart. Rinehart discloses a thermoplastic powder having a melt flow index of at least 0.008 grams/ 10 minutes, where the powder is applied to at least one surface of the substrate to form a particle layer, and the coated substrate is subjected to elevated heat and pressure until the particle layer is fused into a continuous layer and the continuous layer is bonded to the substrate (see abstract). The applied polymer comprises a (meth)acrylate polymer and a fluoropolymer (claim 1 b) and acts as a thermoplastic layer (col. 1, l. 8), which is also called "coating" (col. 1, l. 13 – 23). In contrast to Rinehart, the current invention relates to polymer powder adhesives, which can be activated for adhesion or cohesion ([0001]). The materials used in Rinehart (e.g. polyvinyl chloride, polymethylmethacrylate and others having a very high glass transition temperature as well as fluoropolymers, see e.g. col. 6, l. 35 ff) are not known as functioning as adhesives and are not activateable for that function. In contrast, the materials used in the present invention are very different, having a glass transition temperature T_g of between -60°C and $+40^{\circ}\text{C}$ and are activateable, e.g. containing functional monomers, and reactive monomers, such as silanes, or having heat activatable functional groups [0027]. As anticipation under 35 U.S.C. 102(b) requires identity of invention, in view of the distinctions between Rinehart and the present invention it is respectfully submitted that claims 1 – 2, 4 and 11 are patentable under 35 U.S.C. 102(b) over Rinehart.

Claims 1 – 2, 4 – 5, 7 – 8 and 10 – 11 were rejected as anticipated under 35 U.S.C. 102(b) by US Patent No. 4,859,266, issued to Akasaki. Akasaki discloses a method and apparatus for powder sewing two plies of cloth or fabric material by spraying an adhesive powder onto one side of one ply of cloth or fabric from a powder spray gun having a corona discharge electrode mounted thereon. A second pin electrode is provided on the opposite side of the one ply of cloth or fabric. Pressure and heat applied to the powder activates the powder (see abstract). The term "activation" refers basically to melting the powder (col. 5, l. 26: melting point of

115 to 125°C and col. 5, l. 33-34: surface temperature of the electric iron: 140 to 160°C). It is required that at least two spaced electrodes of differing polarity are used (claim 1, col. 5, l. 53-54). In contrast to Akasaki, the current invention refers to a method whereby an electrostatic charge is applied to the powder (claim 1(b)), which does not require the disadvantageous use of at least two spaced electrodes of differing polarity. Furthermore, the term in the present invention "adhesive is capable of being reactivated and used as an adhesive" covers various different activation means such as moisture, pH, or radiation such as IR, UV, near-IR and x-ray ([0037]). Activation by heat means activation of functional groups, as described in [0027] and example 6 ([0058]). Therefore, the current invention is much more versatile than the disclosure of Akasaki and is not directed to melting the polymer only. As anticipation under 35 U.S.C. 102(b) requires identity of invention, in view of the distinctions between Akasaki and the present invention it is respectfully submitted that claims 1 – 2, 4 – 5, 7 – 8 and 10 – 11 are patentable under 35 U.S.C. 102(b) over Akasaki.

Claims 1 – 2, 4 – 5, 7 – 11 were rejected as anticipated under 35 U.S.C. 102(b) over US Patent No. 4,496,415 issued to Sprengling. Sprengling discloses a method of making a metal clad laminate, useful for circuit boards, comprising the steps of A) uniformly applying a deposit of dry resin particles as a powder onto a fibrous sheet material, B) contacting the powder coated sheet with a metal foil sheet, and C) applying heat and pressure to the sheets, to cause the resin powder particles to melt flow (see claim 1, col. 7, l. 27-43). Consequently, direct contact of a metal foil to apply heat and pressure is required and applying electrostatic charges is optional (col. 2, l. 45-49). Applying infrared radiation is just an alternative method to apply heat (col. 2, l. 54-57), not to activate the powder particles. Again, heat is applied to cause the resin powder particles to melt flow (col. 7, l. 40-44) and not to activate functional groups as in the present invention. Additionally, the polymer powder of the present invention can also be activated by moisture and other means, as mentioned above. As anticipation under 35 U.S.C. 102(b) requires identity of invention, in view of the distinctions between Sprengling and the present invention it is respectfully submitted that claims 1 – 2, 4 – 5, and 7 – 11 are patentable under 35 U.S.C. 102(b) over Sprengling.

Claims 1 – 2 and 4 – 11 were rejected as anticipated under 35 U.S.C. 102(b) over WO 03/076083, filed by Maijala. Maijala describes a method for forming a film on a planar surface, whereby a granular layer is applied on the planar surface by using electrostatic forces, and the granular layer is finished to form the film (claim 1, p.23). An essential feature of the film is that it acts as a barrier coating for liquids, vapors, gases and light (p. 16, l. 1-15). The film needs to be free from pinholes, thus thermomechanical treatment needs to fulfill strict requirements regarding temperature, linear load and dwell time (p. 14, l. 4-9). This film is formed upon subjecting the material to these parameters, whereas the temperature is rather high (80-350°C). Hence, the applied material also just melts and is not reactivated to form an adhesive, as in the present invention. As anticipation under 35 U.S.C. 102(b) requires identity of invention, in view of the distinctions between Maijala and the present invention it is respectfully submitted that claims 1 – 2 and 4 – 11 are patentable under 35 U.S.C. 102(b) over Maijala.

Claim 11 was rejected as being anticipated under 35 U.S.C. 102(b) by US Patent No. 5,928,721, issued to Parker. Parker discloses a process for forming a coated fabric having controlled air permeability less than that of the uncoated fabric (claim 1, col. 8, l. 50-51). It is the object of Parker to provide a coated fabric having a light coating of fused thermoplastic powder preferentially dispersed within the voids of the fabric (col. 2, l. 42-45). It is acknowledged that this reference does not disclose electrostatically depositing thermoplastic powder onto the fabric. Furthermore, it is important to note that Parker discloses a coating, whereas the fused powder preferentially is dispersed within the voids of the fabric (col. 2, l. 42-45). Hence, the coating is not capable of being activated to exhibit adhesive properties. Even if it could activate, the "adhesive" would be hidden in the voids, not being capable of adhering to another surface. Additionally, it does not at all make sense to have a coating which is reactivatable by e.g. moisture or other means to form an adhesive – this would cause severe problems when using it. As anticipation under 35 U.S.C. 102(b) requires identity of invention, in view of the distinctions between Parker and the present invention it is respectfully submitted that claim 11 is patentable under 35 U.S.C. 102(b) over Parker.

Claims 5 and 7-10 were rejected as being unpatentable under 35 U.S.C. 103(a) by Rinehart. The distinctions between Rinehart and the present invention set forth above are equally applicable to the present rejection. As the materials used by Rinehart are very different to the ones used in the present invention and since the activation in the present invention is not just applying heat as described by Rinehart (see also above), it would not at all be obvious to one skilled in the art to use the inventive processes of the present invention. Accordingly, it is respectfully submitted that claims 5 and 7 – 10 are patentable under 35 U.S.C. 103(a) over Rinehart.

Claims 3 and 6 were rejected as being unpatentable under 35 U.S.C. 103(a) by Rinehart and optionally further in view of WO 00/05275. The distinctions between Rinehart and the present invention set forth above are equally applicable to the present rejection. Rinehart et al. does not disclose cationic polymer powders, in particular it does not disclose water redispersible polymer powders. Furthermore, the cited prior art reference WO 00/05275 discloses water redispersible powders, which most typically are used in cementitious systems, but can be used also as powder adhesives. In this context, powder adhesives means powders which can be transferred to a water-based adhesive upon redispersing the powder in water. The cited product Elotex Flex 8300 is such a product. These products are typically being manufactured using spray drying; hence the products are subjected to heat in order to evaporate the water. It is essential that these products not undergo any form of coalescence or film formation during this process to avoid lack of redispersion in water. Hence, the person skilled in the art would not use these in a process described by Rinehart. Further, the invention discloses two essential steps applied to the polymer powder such as the mentioned Elotex Flex 8300, which cannot found at all at either prior art reference:

- a) applying an electrostatic charge to the powder (claim 1 (b)) and
- b) reactivating the applied polymer powder that it can be used as an adhesive (implied by claim 1, last sentence).

The skilled person in the art certainly would redisperse the powder adhesive in water prior to application, and apply it the conventional manner. Therefore it is indeed inventive to combine

these two steps, in particular for redispersible polymer powders. Furthermore, it was unexpected that the fine mist of water, as described in example 3 ([0055]), was sufficient to redisperse the material enough to obtain proper adhesion, and not to cause curling of the paper which would have lead to problems and made the method unacceptable. Accordingly, it is respectfully submitted that claims 3 and 6 are patentable under 35 U.S.C. 103(a) over Rinehart and optionally further in view of WO 00/05275.

In view of the foregoing, it is respectfully submitted that the present application is in condition for allowance. If there are any issues that the Examiner wishes to discuss, the Examiner is invited to contact the undersigned attorney at the telephone number set forth below.

Respectfully submitted,



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